

# MATH 158 Assignment 3, Spring 2013

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Due Monday February 25th at 4:20 pm.

## Section 8.7 Lorenz Curves and the Gini Index

Exercise 24.

Using google, I found that Mexico's Gini index was 0.46 in 2004.

If we assume Mexico's Lorenz curve is  $x^a$  for some  $a$ , find  $a$ .

## Section 9.4 Numerical Integration

Find out from Wikipedia who invented Simpson's rule.

## Section 9.1 Integration by Parts and Section 9.5 Improper integrals

An oil field has been producing oil at a rate  $R(t)$  million barrels of oil per year since 2003. Suppose  $R(t) = te^{-t/5}$  where  $t = 0$  corresponds to 2003.

- In which year did the oil well reach a maximum production rate?
- Sketch the graph of  $R(t)$  for  $0 \leq t \leq 20$ .
- How much oil has it produced so far?
- If the well is left to produce oil indefinitely, how much more oil will it produce?

## Section 10.1 Functions of Several Variables

Exercises 6, 9, 24, 26, 31.

## Section 10.2 Partial Derivatives

Exercises 1, 2, 5, 6, 10, 26, 35, 50, 63, 64, 66. For question 63, it should read  $V = \frac{30.9T}{P}$ .

## Section 10.3 Maxima and Minima

Exercises 4, 10, 27, 28, 40.